

Name: _____ Date: _____

Polynomial Factoring solution (version 617)

1. The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.

$$x^2 - 4x + 12 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(12)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 48}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-32}}{2}$$

$$x = \frac{4 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{4 \pm 4\sqrt{2}i}{2}$$

$$x = 2 \pm 2\sqrt{2}i$$

Notice that i is NOT under the square-root radical symbol!!

2. Express the product of $-2 - 9i$ and $-8 + 4i$ in standard form $(a + bi)$.

Solution

$$(-2 - 9i) \cdot (-8 + 4i)$$

$$16 - 8i + 72i - 36i^2$$

$$16 - 8i + 72i + 36$$

$$16 + 36 - 8i + 72i$$

$$52 + 64i$$

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3. Write function $f(x) = x^3 - 3x^2 - 18x + 40$ in factored form. I'll give you a hint: one factor is $(x - 5)$.

Solution

$$\begin{array}{c|cccc} & 1 & -3 & -18 & 40 \\ 5 & 5 & 10 & -40 & \\ \hline & 1 & 2 & -8 & 0 \end{array}$$

$$f(x) = (x - 5)(x^2 + 2x - 8)$$

$$f(x) = (x - 5)(x + 4)(x - 2)$$

4. Polynomial p is defined below in factored form.

$$p(x) = -(x + 4) \cdot (x - 1) \cdot (x - 4) \cdot (x - 7)^2$$

Sketch a graph of polynomial $y = p(x)$.

